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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* MASA AKI MATSUURA, MASARU USHIJIMA, MASATOSHI  
WAKUI, MITSUTOSHI SETOU, SHIGEKI KAJIHARA, and  
KIYOSHI OGAWA

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Appeal 2017-003534  
Application 13/458,850<sup>1</sup>  
Technology Center 2800

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Before ADRIENE LEPIANE HANLON, LINDA M. GAUDETTE, and  
SHELDON M. McGEE, *Administrative Patent Judges*.

McGEE, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134, Appellants appeal from the Examiner's  
rejection of claims 1–8 under 35 U.S.C. § 101.

We have jurisdiction under 35 U.S.C. § 6.

We reverse.

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<sup>1</sup> Appellants identify the real parties in interest as Japanese Foundation for  
Cancer Research, Keio University, National University Corporation  
Hamamatsu, and Shimadzu Corporation. App. Br. 2.

## SUBJECT MATTER

The subject matter on appeal is directed to a method and system for providing and evaluating mass analysis data on a sample, such as a biological sample. Spec. ¶¶ 1, 9.

Claim 1 is illustrative of the subject matter on appeal:

1. A mass-analysis data processing method for processing mass-analysis data collected by a mass spectrometer, comprising:

performing a mass analysis on each of a plurality of micro areas within a two-dimensional area on a sample and acquiring an optical microscope image on the sample;

a small-area specifying step, in which, based on a visual judgment on an optical microscope image taken for a predetermined area on the sample, a small area that can be regarded as having a same composition or exhibiting a same property is specified for each of two or more portions having different compositions or exhibiting different properties;

an expression information extracting step, in which, for each small area specified in the small-area specifying step as an area having the same composition or exhibiting the same property, the mass-analysis data obtained for all the micro areas included in the small area are processed to extract, as expression information of the concerned small area, peak information that is highly common among the micro areas; and

a specific expression information extracting step, in which the small areas having different compositions or exhibiting different properties are compared in terms of their expression information to extract, for each small area, specific expression information from all the expression information of the concerned small area.

App. Br. 14.

## STATEMENT OF THE CASE

The Examiner rejects claims 1–8 as being directed to an abstract idea because the claims recite “organizing information through mathematical

correlations.” Final Act. 2. The Examiner finds that the claims “do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the steps are mere data gathering with an abstract idea.” *Id.*

Appellants contend, *inter alia*, that the claims represent “an improvement of the functionality of imaging mass spectrometry in combination with optical imaging microscopy,” and that such improvement supports Appellants’ contention that the claims are not directed to an abstract idea. App. Br. 9 (citing *English, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016)). Appellants point to paragraphs 5, 6, and 9–25 of the Specification to support their contention that the claimed subject matter yields “specific[,] meaningful requirements and improvements,” and is, therefore, patent eligible consistent with various precedential Federal Circuit decisions such as *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016). Reply Br. 11–12.

## OPINION

We agree with Appellants that the Examiner has not established the claims are directed to an abstract idea. Thus, we do not sustain the Examiner’s rejection under 35 U.S.C. § 101.

Federal Circuit “[p]recedent has recognized that specific technologic modifications to solve a problem or improve the functioning of a known system generally produce patent-eligible subject matter.” *Trading Techs. Int’l, Inc., v. CQG, INC.*, 675 Fed. Appx. 1001, 1004–05 (Fed. Cir. 2017). For example, a process using “‘a combined order of specific rules’ that improved on existing technological processes were deemed patent-eligible in *McRO [v. Bandai]*, and “[c]laims that were ‘directed to a specific

improvement to the way computers operate . . .’ were deemed eligible in *Enfish[v. Microsoft]*.” *Id.* at 1005.

Here, Appellants’ Specification is replete with references to the improvements associated with the claimed methods and systems in the technological field of processing mass-analysis data on, e.g., biological tissue samples. Spec. ¶¶ 5, 6, 9, 14, 17, and 25–28. For example, the Specification details how, under certain circumstances, the conventional mass data analysis technique is not capable of “provid[ing] useful information for the interpretation or evaluation of the result of the mass-analysis imaging.” *Id.* ¶ 6. By contrast, the inventive method and system provides the mass-analysis data in such a way that an operator may “discriminat[e] different kinds of tissue on a sample or detect[] a specific portion on the sample.” *Id.* ¶ 9.

This discrimination between different types of tissue is accomplished, in part, by the extraction of “specific expression information,” where “only the expression information that is truly specific to [a sample’s] small area is extracted.” *Id.* ¶ 17. The extraction of such “specific expression information” is positively recited in the “specific expression information extracting step” of claim 1, wherein the small areas of a sample “having different compositions or exhibiting different properties are compared in terms of their expression information to extract, for each small area, specific expression information from all the expression information of the concerned small area.” Similarly, the data processing system of claim 2 positively recites “a specific expression information extracting section” for carrying out the comparison of a sample’s small areas, as well as the extraction of the specific expression information for the small area.

Furthermore, independent method claim 3 recites “a common expression information extracting step” which processes “mass-analysis data obtained for [] two micro areas” of a sample in order to “extract, as expression information, peak information that is highly common to the two micro areas.” The data processing system of independent claim 6 recites “a common expression information extracting section” for carrying out the extraction of such information. According to the Specification, “[a] successful extraction of common expression information means that the two micro areas are most likely to belong to a portion having the same composition or exhibiting the same property,” while “if no common expression information can be extracted, it is likely that the two micro areas respectively belong to different portions having different compositions or exhibiting different properties.” Spec. ¶ 21.

According to the Specification, processing the mass-analysis data via the claimed systems and methods<sup>2</sup> makes it “possible to separately obtain information characterizing a lesion site (e.g., cancer) and information characterizing the other, normal sites” which can be “useful, for example, to determine the spread of the lesion site.” *Id.* ¶ 26.

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<sup>2</sup> Paragraph 26 of the Specification indicates that the proper and accurate collection of information that is “specifically expressed on a specific portion of a sample” is achieved with the “data processing methods according to the first and third aspects of the present invention as well as the mass-analysis data processing systems according to the second and fourth aspects of the present invention.” The first, second, third and fourth aspects of the invention substantially track the language of independent claims 1, 2, 3, and 6, respectively. Spec. ¶¶ 10, 11, 19, 20.

In view of such disclosure, we disagree with the Examiner's statement (Ans. 14) that "[n]o improvement of the technology itself is being asserted,"<sup>3</sup> and, thus, cannot agree with the Examiner's finding that the claims amount to no more than an abstract idea. Final Act. 2; Ans. 14.

The inventive methods and systems purport to assist care providers in determining whether, and to what extent, a patient's cancer may have spread in situations where the conventional mass analysis techniques may be unable to do so. Spec. ¶¶ 6, 26. We decline to dismiss such technological advancement as abstract.

Because we do not agree with the Examiner's finding that the claims are directed to an abstract idea, we need not determine whether the claims recite "significantly more" so as to transform the nature of the claim into a patent-eligible concept. *Alice Corp. Pty. Ltd. v. CLS Bank Intern.*, 134 S. Ct. 2347, 2355 (2014).

## SUMMARY

The Examiner's final decision to reject claims 1–8 is reversed.

## REVERSED

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<sup>3</sup> In an attempt to distinguish the appealed claims from the *Enfish v. Microsoft* case (822 F.3d 1327 (Fed. Cir. 2016)), the Examiner also states that "[t]he [data collection] instruments themselves are not being improved." Ans. 15. *Enfish*, however, does not *per se* require an improvement to a physical instrument, but instead recognizes the relevance of the Specification's teachings regarding the improvement "of an existing technology." *Enfish*, 822 F.3d at 1337.